Energy Trust Shade Effect Evaluation Form	70° _г														
37		(c) Univ. of Oregon S	SRML	' '			12	2h			· ·	Estim	ated a	ınnual	AC output
Job Name:		Sponsor: Energy Tru	st		11h	3.0		3.0		13h		1103 k	Whr/y	yr	_
Contractor:	-	- Lat: 45.6; Long: -122. - (Solar) time zone: -8			2					1		for a	1 kW p	oeak DC	system
Date:	60°	Tilt: 22.5; Aspect: 180		7	8				7	3	*				
Array Tilt:	00	Portland, OR	10h	/ }	10 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	3.2	:	3 2		1		lh			
Array Orientation:		-	1011	/ /\$	2.9					9		F11			
Zip Code of Site:		-			2.9					3.0					
	= 00	-	/2.4/	/ \	13				1	Ş.		2.7			
The sun path chart to the right is for a solar electric	50°		9h /		\$Q ^f	1 5	.8	2.6		4 CS		$\setminus \setminus$	15h		
system located in Portland, Oregon tilted 22.5			911 / 2	.4	2.5						2.8	\	1911		
degrees with a 180 degree azimuthal orientation.	-	-	$-/ \lambda $		2.9					2.6	\rightarrow	$\overline{}$	$\overline{}$		
The annual AC output for a 1 kW peak DC system	ă	-	2.0		\				1			/ }	2.1		
with these characteristics is about 1103 kWhr/yr.	ation 004		$^{\prime}$ / \mid \rightarrow	2.1	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	20 I	2.3	0.0	1 %		2.2		++		
	\ \a	- 8h /	/ 1.8 /	2.1	1/2/20	,	<.3	2.3) P	1 X 65	2.2	2.2	$\langle \ \ \rangle$	6h	
For comparison, a 1 kW DC peak system with near	Eleva	-	$\langle - - \rangle$	\backslash	/ 2.	1			2.1	\rightarrow	-	\rightarrow	X	 	
optimum tilt and orientation (32 degree tilt and 190			\	$ \setminus / $	\	2			O _{C×}		\ /		/_	λ	
degree azimuth) will produce approximately	Solar 30°	1.3/	1.5	$\downarrow \downarrow \downarrow$	~ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \				165		\rightarrow	1.7	\ \ \		
1119 kWhr/yr.	SS	$\frac{7h}{1.2}$	Λ			l l	1.7	1.7		1.6		/	1.5	\\ _{17h}	
Local Duadration Committee 1240 leWhalesa	_	- 1.~			$\angle \Box$	1.6			1.6		$-\!\!\!/\!$		Δ	\square	
Local Production Capacity = 1248 kWhr/yr.	-	- / / ,	/ \ /		/	537	1.1	1.2	Ô,			\setminus / \mid		$ \wedge \rangle $	
At Portland, a system oriented as in the sun path	200	Ø.5/ /	ng V	1.1	1.1	0.9			0.8	1.0	1.0	X	0.8	0.8	
chart to the right will produce 98% of the annual	~0	_ X		/\		10)	0.0		$/\setminus$	$/ \setminus $	X	\ \	
electricity produced by an optimally oriented		$\frac{6h}{\sqrt{0.4}}$	/ \	/ \	05	Sec			(3)			/ \	/)	0.6	λ^{18h}
system.		- / / /	\ / \	0.5	70.5					0.6	0.4		$\overline{\ \ }$	X	,
-9	100	- // \ /	0.5	\	\/						\ \ \	0.3	\bigvee_{α}	$ \setminus / $	
	100		\wedge		/						03/		$\int_{-0.}^{0.}$		
		$\begin{bmatrix} 5h \\ / \end{bmatrix} / \begin{bmatrix} h \\ / \end{bmatrix}$	/ \ /	\							0.2		/ \	/\	$\frac{19h}{1}$
Draw the horizon on the sun path chart and shade	-	- /X // \/		 							λ		-+	//	$\overline{\chi}$
obstructed areas. To calculate the percent reduction	-	- / / \	X	<i> </i>							/ /	Λ	\	J/ \	, / \ \
due to shading, enter the percentage of system	L	60° 90°	19	00	150	5	180	C	210	70	240	<u></u> _\	 27	00	300°
power output shown on the sun path chart for areas		60° 90° 120° 150° 180° 210° 240° 270° 300° East < Solar Azimuth> West													
shaded by obstructions into the table on the right.		Edst \ Soldi Azili'deli / #est													
		Period/Hr 5-6	6-7 7-	8 8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Period/Hr
For example, assume the percentage of system		May-Jun													Jun-Jul
power output from 7:00 to 8:00 between September		Apr-May													Jul-Aug
22 and October 21 is 0.4%, and 50% of that period is shaded. Enter 0.2% in the column under 7.8 and		Mar-Apr													Aug-Sep
is shaded. Enter 0.2% in the column under 7-8 and the row labeled Feb-Mar on one side and Sep-Oct		Feb-Mar													Sep-Oct
on the other. Enter zero for each box where there is		Jan-Feb													Oct-Nov
no shading. Note that hours are in solar time.		Dec-Jan													Nov-Dec
The street first from the first street fille.															
		Sum of				1	1			1			1	(Sum of

Hourly Shading

Hourly Shading

Sum the shading values in each column and enter

determine the percent annual shading.

Pct Annual Shading:

the total in the bottom row. Sum the bottom row to